

**SMALLPOX FACT SHEET – *Information for Clinicians*****Medical Management of Smallpox (Vaccinia) Vaccine Adverse Reactions**

Smallpox vaccination (vaccinia) is a generally safe and effective means to prevent smallpox. However, in a number of individuals, smallpox vaccination can result in untoward effects and adverse reactions. The majority of adverse reactions caused by the smallpox vaccine are mild to moderate complications that resolve on their own. Serious reactions are rare, but can be fatal.

There are two medications that may help persons who have certain serious reactions to the smallpox vaccine; vaccinia immune globulin (VIG) and cidofovir. VIG has been extensively used in the past and felt (but not shown in controlled studies) to be effective. Cidofovir may be effective based on studies in animals. Treatment with these medications may require the vaccine recipient to be in the hospital. They are investigational and may cause a number of serious side effects themselves.

Vaccinia Immune Globulin (VIG)

- Vaccinia immune globulin (VIG) is a product used to treat certain serious adverse reactions caused by smallpox vaccine. There are about 2,700 treatment doses of VIG (enough for predicted reactions with more than 27 million people). Additional doses of VIG are being produced this year.
- VIG was produced in the 1960s from plasma obtained from recently vaccinated donors. It contained a high titer of anti-vaccinia neutralizing antibody. Because it contained a high proportion of aggregated protein it was administered solely by the intramuscular route and could not be used intravenously.
- An effort is underway to produce new lots of VIG that will meet the standards for intravenous immune globulin. This IV-VIG will require new recommendations for both dosage and preferred method of administration. The new IV-VIG has a low level of aggregated protein, allowing it to be used by either the IM or IV route. Intravenous VIG will be most likely administered at a lower dose than the intramuscular preparation.

VIG Indications, Precautions and Contraindications

- Historically, VIG has been indicated for accidental implantation involving extensive lesions, eczema vaccinatum, generalized vaccinia, and progressive vaccinia.
- VIG is NOT recommended for mild instances of accidental implantation, mild or limited generalized vaccinia, erythema multiforme, or encephalitis post-vaccination.
- For more information on the adverse reactions mentioned above, go to www.cdc.gov/smallpox.

Concomitant Use of VIG with Vaccination

In some instances, VIG was given concomitantly with vaccination to “prevent” complications in a susceptible person. Not enough is known about the efficacy of this practice to recommend its use. Furthermore, there is currently an insufficient amount of VIG to use prophylactically when the benefits are uncertain.

Dosage

When it was used in the 1950s-1970s, the dosage of VIG varied. In general an initial dose of 0.6 ml/kg body weight was injected intramuscularly and subsequent administration determined by the course of illness.

In severe cases of eczema vaccinatum and progressive vaccinia as much as 1-10 ml/kg was used. These large doses were split into smaller units, and injected at multiple sites spread out over time.

Frequency of Use

Data from a CDC survey indicates that VIG was administered at a rate of 47 uses per 1 million primary vaccinees and 2 uses per million revaccinees.

Cidofovir

Another drug that may be used to treat certain serious smallpox vaccine reactions is cidofovir, an antiviral drug marketed as Vistide.

- Cidofovir is currently licensed for the treatment of CMV retinitis and has demonstrated antiviral activity against poxviruses in vitro, and against cowpox and vaccinia viruses in mice.
- However, its use for the treatment of vaccinia adverse reactions is restricted under an Investigational New Drug (IND) protocol. Under the IND, cidofovir would only be used when VIG was not efficacious.
- Renal toxicity is a known adverse reaction of cidofovir.

For more information, visit www.cdc.gov/smallpox, or call the CDC public response hotline at (888) 246-2675 (English), (888) 246-2857 (Español), or (866) 874-2646 (TTY)
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